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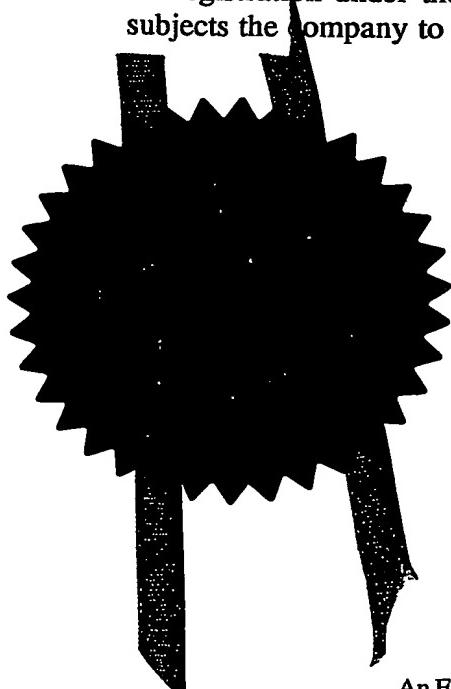
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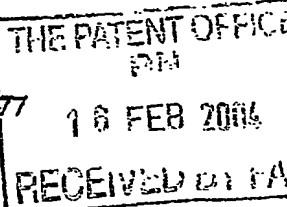
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Dated 1 April 2005



Patents Form 1/77

Patents Act 1977  
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16 FEB 2004

16FEB04 E873624-1 002894  
P01/7700 0.00-0403365.0 ACCOUNT CHA**Request for grant of a patent**

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

16 FEB 2004

The Patent Office

Cardiff Road  
Newport  
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NP10 8QQ

1. Your reference

P36589-SSI/SMI/GEM

2. Patent application number

(The Patent Office will fill this part in)

0403365.0

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Tilda Limited  
Coldharbour Lane  
Rainham  
Essex  
RM13 9YQ

Patents ADP number (if you know it)

07565591001

If the applicant is a corporate body, give the country/state of its incorporation

United Kingdom

4. Title of the invention

"Packaging for Foodstuffs and a Method of Packaging Same"

5. Name of your agent (if you have one)

SCEPTRE

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Scotland House  
165-169 Scotland Street  
Glasgow  
G5 8PL

Patents ADP number (if you know it)

07047095004

07047095002

6. Priority: Complete this section if you are declaring priority from one or more earlier patent applications, filed in the last 12 months.

Country

Priority application number

(if you know it)

Date of filing  
(day / month / year)

United Kingdom

7. Divisionals, etc: Complete this section only if this application is a divisional application or resulted from an entitlement dispute (see note D)

Number of earlier UK application  
(day / month / year)

8. Is a Patents Form 7/77 (Statement of inventorship and of right to grant of a patent) required in support of this request?

Yes

Answer YES if:

- a) any applicant named in part 3 is not an inventor, or
- b) there is an inventor who is not named as an applicant, or
- c) any named applicant is a corporate body.

Otherwise answer NO (See note D)

Patents Form 1/77

0094785 16 Feb 04 05:01

## Patents Form 1/77

9. Accompanying documents: A parent application must include a description of the invention. Not counting duplicates, please enter the number of pages of each item accompanying this form:

Continuation sheets of this form

Description	9	
Claim(s)	-	
Abstract	-	
Drawing(s)	1	

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for a preliminary examination and search (Patents Form 9/77)

Request for a substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature(s)



Date 16/02/2004

12. Name, daytime telephone number and e-mail address, if any, of person to contact in the United Kingdom

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## Notes

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- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
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1       Packaging for Foodstuffs and a Method of Packaging  
2       Same

3

4       The present invention relates to packaging for  
5       foodstuffs and particularly, but not exclusively, to  
6       cereal based foodstuffs and a method of packaging  
7       same within flexible-walled containers.

8

9       Modified Atmosphere Packaging (MAP) of food products  
10      in a variety of pack formats and materials is a  
11      longstanding technique used to reduce the  
12      atmospheric air content of a sealed pack. By  
13      reducing the oxygen content of a sealed pack the  
14      shelf life of the product can be significantly  
15      increased by delaying the onset of oxidative  
16      rancidity, particularly in products containing oils.

17

18      The availability of gusseted plastics laminate  
19      pouches with appropriate barrier properties has  
20      enabled the development of Pre-Cooked Ambient (PCA)  
21      products. Suitable pouches can (i) withstand  
22      conventional full sterilisation retort processes;

1       (ii) retain very low oxygen and moisture  
2       permeability after the retort process; and (iii)  
3       allow foodstuffs to be reheated in a microwave oven.  
4       Many foodstuffs such as rice, noodles, pasta, sauces  
5       and petfood containing small quantities of oil  
6       currently use MAP and consequently benefit from  
7       ambient shelf lives of 12-18 months.

8  
9       The MAP process involves filling the pouches with a  
10      foodstuff and flushing the pouches with inert gases  
11      (such as nitrogen and carbon dioxide) to remove  
12      their oxygen content. The inert gas or gas mixture  
13      inhibits proliferation of some micro-organisms  
14      (moulds and bacteria) with no significant chemical  
15      alteration of the product. The pouches are then  
16      mechanically squeezed to remove substantially all of  
17      the gas mixture and then sealed to achieve a  
18      residual oxygen content of typically below 2% and  
19      ideally below 1%. After sealing the pouch is  
20      subjected to the full retort sterilisation process.

21  
22      In the packaging of rice, noodles, pasta and related  
23      recipe products (an example of which is egg fried  
24      rice containing discrete pieces of scrambled egg and  
25      peas), the purging of gases from within a pouch  
26      during the MAP process results in the compression  
27      and agglomeration of the foodstuff. Using rice as  
28      an example, agglomeration of the separate grains  
29      means that the product suffers in a presentational  
30      sense and is somewhat unappealing to the consumer.

31

1 According to the present invention there is provided  
2 a partially inflated flexible-walled container for  
3 foodstuffs, said container being partially inflated  
4 by an inert gas.

5

6 Preferably, the container contains a foodstuff.

7

8 Preferably, the foodstuff is cereal based.

9

10 Preferably, the cereal is selected from the group  
11 consisting of rice, couscous, wild rice, barley,  
12 wheat, oats, rye, millet and maize.

13

14 Most preferably, the cereal is rice.

15

16 Preferably, the flexible-walled container is a  
17 plastics pouch.

18

19 Preferably, the plastics pouch is gusseted.

20

21 Preferably, the plastics pouch is formed from  
22 microwaveable material.

23

24 Preferably, the inert gas is selected from the group  
25 consisting of nitrogen, carbon dioxide, helium,  
26 argon, neon and xenon.

27

28 Most preferably, the inert gas is nitrogen.

29

30 Preferably, oxygen gas forms less than 2% of the  
31 volume of gas within the container.

32

1     Most preferably, oxygen gas forms less than 1% of  
2     the volume of gas within the container.

3  
4     Preferably, the volume of inert gas within the  
5     container is selected to reduce agglomeration of  
6     discrete pieces of the foodstuff.

7  
8     Preferably, the volume of inert gas within the  
9     container increases is selected to increase the  
10    overall volume of the container by at least 5%.

11  
12    According to a second aspect of the present  
13    invention there is provided a method of filling a  
14    container according to the first aspect comprising  
15    the steps of:

- 16                 (i) introducing a foodstuff into a flexible-  
17                 walled container;  
18                 (ii) purging substantially all oxygen from the  
19                 container by flushing it with an inert gas;  
20                 (iii) sealing the container.

21  
22    Preferably, the step of purging oxygen from the  
23    container involves introducing a selected volume of  
24    inert gas into the container such that the container  
25    is inflated by the inert gas.

26  
27    Preferably, the container subsequently has its  
28    internal volume reduced such that the container is  
29    partially inflated by the inert gas.

30  
31    Preferably, the step of sealing the container is  
32    performed whilst the container is partially inflated

1 to thereby retain a selected volume of inert gas  
2 therein.

3

4 Preferably, the step of sealing the container is  
5 achieved by heat sealing.

6

7 Embodiments of the present invention will now be  
8 described, by way of example only, with reference to  
9 the following drawings in which:

10

11 Fig. 1 is a flow diagram showing the packaging  
12 process of the present invention; and

13

14 Fig. 2 is a table showing the relative  
15 characteristics of conventional pouches filled using  
16 both conventional means and by the method of the  
17 present invention.

18

19 Fig. 1 outlines the various production line stages  
20 involved in implementing the method of filling  
21 pouches.

22

23 Step 1: The first stage involves picking up and  
24 holding a pouch at its top corners in the  
25 conventional way. At this point, the gusset at the  
26 base of the pouch is in a folded state such that the  
27 whole pouch is in a substantially flat orientation.

28

29 Step 2: The second stage involves mechanically  
30 separating the walls of the unsealed end of the  
31 pouch and introducing nitrogen gas therein. The  
32 nitrogen gas acts to increase the pressure within

1 the pouch and therefore unfolds the gusset into  
2 deployment.

3

4 Step 3: For the case of solid foodstuffs (or a  
5 mixture of solids and liquids), these are introduced  
6 into the opened pouch whilst the flow of nitrogen  
7 gas is maintained. This step ensures that oxygen is  
8 flushed from the pouch before being trapped by the  
9 foodstuff.

10

11 Step 4: If the foodstuff is entirely liquid then no  
12 gas is introduced concurrently with the foodstuff.

13

14 Step 5: Once the foodstuff (whether solid or liquid  
15 or both) is introduced into the pouch, a flat nozzle  
16 is inserted into its unsealed end. The walls of the  
17 unsealed end are pulled tight against the nozzle  
18 which then inflates the pouch with nitrogen gas.  
19 Once the pouch is inflated, the flat nozzle is  
20 removed from the pouch.

21

22 Step 6: The pouch is squeezed in a controlled manner  
23 thus removing a selected volume of nitrogen gas and  
24 reducing the overall volume of the pouch. Once the  
25 pouch reaches the desired volume, the unsealed end  
26 is heat sealed. The desired volume will vary  
27 depending upon the amount and type of foodstuff  
28 being packaged.

29

30 Step 7: The pouch then undergoes the full retort  
31 sterilisation process wherein trays of pouches are  
32 transferred into a conventional overpressure retort

1 and subjected to a thermal process (either static or  
2 rotational) designed to achieve commercial sterility  
3 appropriate to the nature of the contents (e.g. 6  
4 minutes at 121°C for rice products). Retort  
5 temperatures must not exceed those specified by  
6 pouch manufacturers (normally 130°C).

7

8 Alternatively, neither, either or both of steps 2  
9 and 3 are used in combination with step 5 to achieve  
10 the required level of oxygen in the sealed pouch  
11 which will be dependent on the nature of its  
12 contents. Step 6 controls the final volume of the  
13 pouch.

14

15 Depending upon the nature of the pouch contents,  
16 either or both of steps 3 and 4 are implemented.  
17

18 It will be appreciated by those skilled in the art  
19 that the preceding steps have the following  
20 important benefits and improvements. In view of the  
21 fact that the pouch is sealed whilst retaining a  
22 selected volume of gas, the consumer's perception is  
23 that the partially inflated pouch looks less rigid,  
24 less processed and has an overall enhanced on-shelf  
25 appeal.

26

27 Moreover, in the conventional packaging process,  
28 pouches are squeezed to remove substantially all gas  
29 to reduce the volume of the pouches to that of their  
30 contents. Accordingly, when emptying conventionally  
31 packaged pouches the contents are often lumpy and  
32 unappealing to the consumer. The consumer is

1        compelled to squeeze the pouch during or subsequent  
2        to emptying its contents in order to break up and  
3        separate the agglomerated foodstuff. However, the  
4        partial inflation of the pouch of the present  
5        invention reduces agglomeration of its contents and  
6        promotes conditions wherein the foodstuff retains  
7        its original and familiar characteristics. For  
8        example, in the case of rice, the grains remain  
9        light, fluffy and separated.

10  
11      Fig. 2 demonstrates the increased volume of pouches  
12      packaged using the method of the present invention  
13      using the mean volume of a conventionally packaged  
14      pouch as a reference. As discussed previously,  
15      conventionally packaged pouches retain substantially  
16      no gas after they are sealed and their volume is  
17      therefore substantially equal to the volume of their  
18      contents.

19  
20      The mean volume of pouches (of equal width/height  
21      and containing the same weight/type of foodstuff)  
22      filled by the packaging method of the present  
23      invention is, in the present non-limiting example  
24      shown in Fig. 2, at least 11.4% greater than the  
25      conventionally packaged reference pouch.

26  
27      Depending upon the nature of the foodstuff contained  
28      within the partially inflated pouch, the increase in  
29      volume over that of the reference is adapted to be  
30      at least 5%.

31

1 Accordingly, it will be further appreciated by those  
2 skilled in the art that such an increase in volume  
3 is beneficial in terms of reducing the pressure  
4 applied to the foodstuff by the walls of the  
5 container. Therefore, the likelihood of  
6 agglomeration of, for example, cereal grains during  
7 the retort sterilisation process and during storage,  
8 distribution and use is substantially reduced.  
9 Maintaining separate free flowing cereal grains is a  
10 critical quality parameter making the product more  
11 appealing to the consumer and is absent in  
12 foodstuffs made using conventional processes.  
13  
14 Modifications and improvements may be made without  
15 departing from the scope of the present invention.  
16 For example, the flexible walled container may be  
17 made from a non-microwavable foil-based material or  
18 from a material suitable for boil-in-bag cooking.

FIG. 1

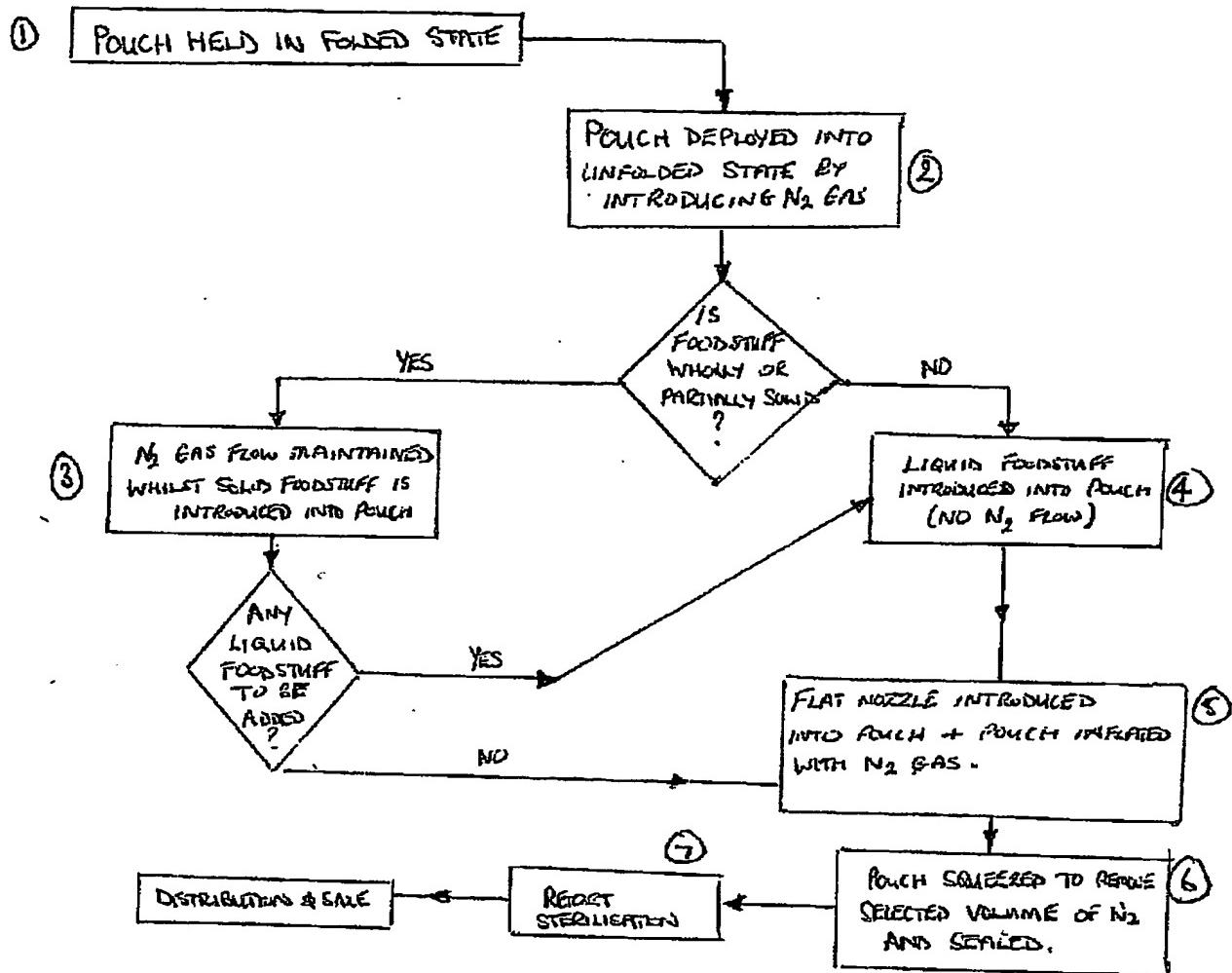


FIG. 2.

PROCESS	CONVENTIONAL	PRESENT INVENTION
POUCH DIMENSIONS	140 x 185 mm	140 x 185 mm
POUCH + CONTENTS WEIGHT	250g	250g
TOTAL POUCHES MEASURED	20	23
MEAN VOLUME	463 ml (Reference)	533 ml (+15.1%)
MINIMUM VOLUME	446 ml (-3.6%)	516 ml (+11.4%)
MAXIMUM VOLUME	476 ml (+2.8%)	560 ml (+20.1%)

# **Document made available under the Patent Cooperation Treaty (PCT)**

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